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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/091,528	03/07/2002	Masafumi Sakuma	Q68862	8346

7590 01/02/2004
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EXAMINER

MULLINS, BURTON S

ART UNIT	PAPER NUMBER
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2834

DATE MAILED: 01/02/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/091,528

Applicant(s)

SAKUMA ET AL.

Examiner

Burton S. Mullins

Art Unit

2834

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 October 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 and 3-15 is/are pending in the application.
- 4a) Of the above claim(s) 12-15 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1 and 5-7 is/are rejected.
- 7) ☒ Claim(s) 3,4 and 8-11 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
- a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
2. Claims 1 and 5-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fratta (US 4,924,130). Fratta teaches a synchronous reluctance motor comprising: a stator S having a predetermined number of toothed stator magnetic pole portions (not numbered, Fig.7) wound by armature coils (c.8, lines 65-67), and a rotor rotatably supported at an inner peripheral surface of the stator and having a pair of slots or “cavities” formed by intercalary non-ferromagnetic layers I (Fig.6; c.6, lines 40-45) formed in the circumferential direction of the rotor and extending along the inner periphery of the stator with a predetermined interval (Fig.6), wherein the pair of slots includes an outer side slot formed at an outer periphery side of the rotor and an inner side slot formed at an inner side of the rotor (Fig.6), wherein both the outer side slot and the inner side slot extend toward the outer peripheral surface of the rotor to form a rotor magnetic pole portion B' (Fig.6). Further, though not explicitly taught by Fratta, it is nevertheless inherent that “a width of an effective magnetic path between the outer periphery of the rotor and the outer side slot is defined based on a width of a stator magnetic pole portion multiplied by a predetermined number” since Fratta’s effective magnetic path width will always be equal to the product of the stator pole width and a “predetermined number” no matter what design constraints are placed on the motor.

Fratta differs in that he does not teach that the “predetermined number” defining the ratio between the rotor magnetic path and the stator pole widths is between 0.7 and 1.3, per se.

However, this range for the ratio would have been an obvious design choice since it has been held that where the general conditions of a claim are disclosed, discovering the optimum or workable ranges involves only routine skill. In re Aller, 105 USPQ 233. In Figs.5-6, Fratta clearly discloses a “width of an effective magnetic path between the outer periphery of the rotor and the outer side slot” consisting of the width of member B forming an interpolar space (c.5, lines 63-66). Fig.7 clearly indicates stator poles with a width. Hence, a ratio exists in Fratta and therefor the general conditions of the claim are disclosed. Further, Fratta is a reluctance machine and operates in the same manner as applicant’s reluctance machine, and applicant has not provided any evidence of unexpected result which is different in kind and not merely degree from the results of Fratta’s machine.

Similarly, regarding claim 5, the distance between the slots in Fratta will always be some “second predetermined” number multiplied by the stator pole width.

Regarding claim 6, Fratta does not teach a “second predetermined number” defining the ratio between the inter-slot distance and the stator pole width between $\frac{1}{3}$ and 1. As with the previous range governing the rotor magnetic path and stator pole width ratio in claim 1, this range would have been an obvious design choice since it has been held that where the general conditions of a claim are disclosed, discovering the optimum or workable ranges involves only routine skill. In re Aller, 105 USPQ 233.

Regarding claim 7, a permanent magnet M is disposed in each of the outer side slot and the inner side slot formed in the rotor (Fig.6).

Response to Arguments

3. Applicant's arguments filed 8 October 2003 have been fully considered but they are not persuasive. Applicant argues that Fratta does not teach that "a width of an effective magnetic path between the outer periphery of the rotor and the outer side slot is defined based on a width of a stator magnetic pole portion multiplied by a predetermined number in the range of 0.7 and 1.3" as now claimed in claim 1. The examiner notes that in the specification p.3, line 24-p.4, line 2, applicant's determination of the width of the effective magnetic path results in a machine "capable of generating the reluctance torque and reducing the torque ripple". Presumably, these are the "advantageous operations" which applicant argues distinguishes his machine over Fratta. However, these are not unexpectedly superior operations. Fratta is a reluctance machine capable of generating reluctance torque. While torque ripple occurs for a number of reasons, the torque ripple in Fratta is inherently "reduced" to some extent by proportioning the permanent magnets to compensate the magnetic flux along the quadrature axis when the current flowing through the stator windings is the nominal current of the machine (abstract, lines 11-15), and by the fact that each ferromagnetic layer of the rotor always faces an identical extension of the ferromagnetic material of the stator (c.8, lines 4-7). Further, Fratta notes the desirability of a machine delivering constant torque at various speeds (c.1, lines 34-41). Applicant has not established to a sufficient extent that his machine, by utilization of the claimed range, yields unexpectedly superior results. In re Linder, 173 USPQ 356 (CCPA 1972). Neither has applicant established that his claimed range produces a new and unexpected result which is different in kind and not merely degree from the results of Fratta. In re Aller, 105 USPQ 233 (CCPA 1955).

Allowable Subject Matter

4. Claims 3-4 and 8-11 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Regarding claim 3, the prior art---in particular Fratta---does not teach or suggest that the first opening angle equals the second opening angle multiplied by $(n/2m)$, n being the ratio of the stator poles to rotor poles and m being the number of phases. Regarding claim 8, the prior art---in particular Fratta--does not teach that a first total magnetic flux of the outer side permanent magnet is larger than or equal to a second total magnetic flux of the inner side permanent magnet when the center-line of the outer side slot and the inner side slot in a circumferential direction of the rotor is adjacent one or more of the center-lines of the stator magnetic pole portions in the circumferential direction of the stator.

5. The examiner also notes that claims 12-15 have been withdrawn from consideration, but nevertheless still remain pending in the case.

Oath/Declaration

6. Receipt is acknowledged of the new oath including corrections to the errors noted in the previous action.

Priority


7. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Conclusion

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Burton S. Mullins whose telephone number is 305-7063. The examiner can normally be reached on Monday-Friday, 9 am to 5 pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nestor Ramirez can be reached on 308-1371. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306 (including after final correspondence). Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 308-0956.


BURTON S. MULLINS
PRIMARY EXAMINER

12/30/03